

What is claimed is:

1. An electro-mechanical actuator comprising:
a brushless DC motor for driving an output of said actuator; and
a controller configured to interrupt operation of said motor in response to at least one feedback signal, said feedback signal being representative of a motor parameter that varies with variation in a load on said output.
2. An actuator according to claim 1, wherein said brushless DC motor is coupled to said output through a gear train.
3. An actuator according to claim 1, wherein said controller is configured to interrupt operation of said motor when said feedback signal reaches a predetermined value.
4. An actuator according to claim 1, wherein said feedback signal is representative of motor current draw.
5. An actuator according to claim 4, wherein said controller is configured to disable said motor when variation of said motor current draw with torque reaches a predetermined level.
6. An actuator according to claim 4, said actuator further comprising a current sensor for providing said feedback signal.
7. An actuator according to claim 1, wherein said feedback signal is representative of motor speed.

8. An actuator according to claim 7, wherein said controller is configured to disable said motor when variation of said motor speed with torque reaches a predetermined level.
9. An actuator according to claim 8, said wherein said feedback signal is representative a rotational position of a rotor of said motor.
10. An actuator according to claim 9, said actuator further comprising at least one position sensor for providing said feedback signal.
11. An actuator according to claim 10, wherein said at least one position sensor comprises a Hall effect sensor disposed adjacent said rotor.
12. An actuator according to claim 11, wherein said rotor comprises a two-pole pair permanent magnet rotor, and said at least one position sensor comprises three Hall effect sensors equally spaced along a circumference of said rotor.
13. An actuator according to claim 9, wherein said controller is configured to disable said motor when said rotor has made a predetermined number of rotations and variation of said motor speed with torque reaches a predetermined level.
14. A vehicle window lift system for moving a vehicle window between open and closed positions, said system comprising:
a brushless DC motor for driving an output of an actuator, said output being coupled to a window lift mechanism for moving said window between said open and closed positions; and
a controller configured to interrupt operation of said of said motor in response to at least one feedback signal, said feedback signal being

representative of a motor parameter that varies with variation in a load on said window.

15. A system according to claim 14, wherein said brushless DC motor is coupled to said output through a gear train.
16. A system according to claim 14, wherein said controller is configured to interrupt operation of said motor when said feedback signal reaches a predetermined value.
17. A system according to claim 14, wherein said feedback signal is representative of motor current draw.
18. A system according to claim 17, wherein said controller is configured to disable said motor when variation of said motor current draw with torque reaches a predetermined level.
19. A system according to claim 17, said actuator further comprising a current sensor for providing said feedback signal.
20. A system according to claim 14, wherein said feedback signal is representative of motor speed.
21. A system according to claim 20, wherein said controller is configured to disable said motor when variation of said motor speed with torque reaches a predetermined level.
22. A system according to claim 21, said wherein said feedback signal is representative a rotational position of a rotor of said motor.

23. A system according to claim 22, said actuator further comprising at least one position sensor for providing said feedback signal.
24. A system according to claim 23, wherein said at least one position sensor comprises a Hall effect sensor disposed adjacent said rotor.
25. A system according to claim 24, wherein said rotor comprises a two-pole pair permanent magnet rotor, and said at least one position sensor comprises three Hall effect sensors equally spaced along a circumference of said rotor.
26. A system according to claim 20, wherein said controller is configured to disable said motor when said rotor has made a predetermined number of rotations and variation of said motor speed with torque reaches a predetermined level.
27. A method of providing pinch protection in vehicle window lift system for moving a vehicle window between open and closed positions, said method comprising:
 - providing a brushless DC motor for driving an output of an actuator, said output being coupled to a window lift mechanism for moving said window between said open and closed positions;
 - sensing at least one parameter of said motor that varies with a variation in a load on said window; and
 - disabling said motor when said parameter reaches a predetermined level.
28. A method according to claim 27, said method further comprising:
 - identifying at least one zone of travel for said window wherein pinch protection is enabled; and

determining if said window is in said zone,
and wherein said motor is disabled in said disabling step if said window
is in said zone as determined in said determining step.

29. A method according to claim 27, wherein said parameter comprises current
draw of said motor.

30. A method according to claim 27, wherein said parameter comprises motor
speed.

31. A method according to claim 27, wherein said parameter comprises
rotational position of a rotor of said motor.

32. A method according to claim 27, wherein said parameters comprise current
draw of said motor and motor speed.

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